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1 [Analysis of actual fault mechanisms in CMOS logic gates](#)

Glenn R. Case

June 1976 **Proceedings of the 13th conference on Design automation DAC '76**

Publisher: ACM Press

Full text available: [pdf\(493.98 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

An analysis of failure modes in CMOS logic gates is presented. An example 3-input NAND gate is analyzed in detail and the ramifications of its failure modes are discussed.

2 [Modeling the lot selection process in semiconductor photolithography processing](#)

Thomas C. McGuigan

December 1992 **Proceedings of the 24th conference on Winter simulation WSC '92**

Publisher: ACM Press

Full text available: [pdf\(351.05 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

3 [Scientific visualization and data modeling of scattered sediment contaminant data in New York/New Jersey estuaries](#)

Hong Ma, Keith W. Jones, Eric A. Stern

October 1998 **Proceedings of the conference on Visualization '98 VIS '98**

Publisher: IEEE Computer Society Press

Full text available: [pdf\(769.11 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

[Publisher Site](#)

Keywords: scattered data modeling, spectral domain decompositon method

4 [Dynamic data driven application simulation: sensor/simulation fusion: DDDAS approaches to wildland fire modeling and contaminant tracking](#)

Craig C. Douglas, Robert A. Lodder, Richard E. Ewing, Yalchin Efendiev, Guan Qin, Janice Coen, Mauricio Kritz, Jonathan D. Beezley, Jan Mandel, Mohamed Iskandarani, Anthony Vodacek, Gundolf Haase

December 2006 **Proceedings of the 37th conference on Winter simulation WSC '06**

Publisher: Winter Simulation Conference

Full text available: [pdf\(203.65 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

We report on two ongoing efforts to build Dynamic Data Driven Application Systems (DDDAS) for (1) short-range forecasting of weather and wildfire behavior from real time weather data, images, and sensor streams, and (2) contaminant identification and tracking in water bodies. Both systems change their forecasts as new data is received. We use one long term running simulation that self corrects using out of order, imperfect sensor data. The DDDAS versions replace codes that were previously run us ...

- 5 Semiconductor manufacturing: semiconductor factory scheduling and control: Intelligent simulation-based lot scheduling of photolithography toolsets in a wafer fabrication facility

Amr Arisha, Paul Young

December 2004 **Proceedings of the 36th conference on Winter simulation WSC '04**

Publisher: Winter Simulation Conference

Full text available: [pdf\(436.55 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Scheduling of a semiconductor manufacturing facility is one of the most complex tasks encountered. Confronted with a high technology product market, semiconductor manufacturing is increasingly more dynamic and competitive in the introduction of new products in shorter time intervals. Photolithography, being one of the processes repeated often, is a fabrication bottleneck. Lot scheduling within photolithography is a challenging activity where substantial improvements in factory performance can be ...

- 6 DYNAMIC DATA-DRIVEN INVERSION FOR TERASCALE SIMULATIONS: REAL-TIME IDENTIFICATION OF AIRBORNE CONTAMINANTS

VOLKAN AKCELIK, GEORGE BIROS, ANDREI DRAGANESCU, JUDITH HILL, OMAR GHATTAS, BART VAN BLOEMEN WAANDERS

November 2005 **Proceedings of the 2005 ACM/IEEE conference on Supercomputing SC '05**

Publisher: IEEE Computer Society

Full text available: [pdf\(666.70 KB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

In contrast to traditional terascale simulations that have known, fixed data inputs, dynamic data-driven (DDD) applications are characterized by unknown data and informed by dynamic observations. DDD simulations give rise to inverse problems of determining unknown data from sparse observations. The main difficulty is that the optimality system is a boundary value problem in 4D space-time, even though the forward simulation is an initial value problem. We construct special-purpose parallel multig ...

- 7 Semiconductor manufacturing: Simulation-based solution of load-balancing problems in the photolithography area of a semiconductor wafer fabrication facility

Lars Mönch, Matthias Prause, Volker Schmalfuss

December 2001 **Proceedings of the 33rd conference on Winter simulation WSC '01**

Publisher: IEEE Computer Society

Full text available: [pdf\(230.41 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper we present the results of a simulation study for the solution of load-balancing problems in a semiconductor wafer fabrication facility. In the bottleneck area of photolithography the steppers form several different subgroups. These subgroups differ, for example, in the size of the masks that have to be used for processing lots on the steppers of a single group. During lot release it is necessary to distribute the lots over the different stepper groups in such a way that global targ ...

- 8 Validation and verification of the simulation model of a photolithography process in

semiconductor manufacturing

Nirupama Nayani, Mansooreh Mollaghazemi

December 1998 **Proceedings of the 30th conference on Winter simulation WSC '98**

Publisher: IEEE Computer Society Press

Full text available: [pdf\(79.51 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

9 Assessment of potential gains in productivity due to proactive reticle management**using discrete event simulation**

Sungmin Park, John Fowler, Matt Carlyle, Matt Hickie

December 1999 **Proceedings of the 31st conference on Winter simulation: Simulation--a bridge to the future - Volume 1 WSC '99**

Publisher: ACM Press

Full text available: [pdf\(121.69 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

10 Validating simulation model cycle times at Seagate Technology

Navdeep S. Grewal, Alvin C. Bruskà, Timbur M. Wulf, Jennifer K. Robinson

December 1999 **Proceedings of the 31st conference on Winter simulation: Simulation--a bridge to the future - Volume 1 WSC '99**

Publisher: ACM Press

Full text available: [pdf\(87.34 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

11 Software domain modeling and meta-modeling: Design of knowledge-based systems**with the ontology-domain-system approach**

Xin Wang, Christine W. Chan, Howard J. Hamilton

July 2002 **Proceedings of the 14th international conference on Software engineering and knowledge engineering SEKE '02**

Publisher: ACM Press

Full text available: [pdf\(187.77 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

An ontology is a comprehensive knowledge model that enables a developer to practice a "higher" level of reuse, namely knowledge reuse. To achieve knowledge reuse instead of software reuse, we propose forging a closer mapping between the knowledge and software models in the development process. In this paper, we first present UML as an ontology modeling language and then describe the Ontology-Domain-System approach to deriving a system model from a UML-based ontology model.

12 Yield modeling and BEOL fundamentals

José Pineda de Gyvez

March 2001 **Proceedings of the 2001 international workshop on System-level interconnect prediction SLIP '01**

Publisher: ACM Press

Full text available: [pdf\(850.38 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The advent of deep submicron technologies with larger die sizes lends itself to an increase in fabrication cost. An appropriate yield forecast renders significant benefits in both time-to-market and manufacturing cost prediction. Yield forecasting is essential for the development of new products as it effectively shows if a design is feasible of meeting its cost objectives or not. In mature manufacturing processes, spot defects are the main detractors in the successful outcome of an IC. The ...

13 Predicting environmental restoration activities through static simulation

Terry L. Ross, Dale A. King, Mark L. Wilkins, Mary F. Forward

December 1994 **Proceedings of the 26th conference on Winter simulation WSC '94**

Publisher: Society for Computer Simulation International

Full text available:  pdf(675.74 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

**14 Biological/environmental simulations: biological/environmental simulations: A probabilistic total system approach to the simulation of complex environmental systems**

Rick Kossik, Ian Miller

December 2004 **Proceedings of the 36th conference on Winter simulation WSC '04**

Publisher: Winter Simulation Conference

Full text available:  pdf(445.83 KB) Additional Information: [full citation](#), [abstract](#)

GoldSim is a powerful and flexible Windows-based computer program for carrying out probabilistic simulations of complex systems to support management and decision-making in engineering, science and business. The program is highly graphical, highly extensible, able to directly represent uncertainty, and allows you to create compelling presentations of your model. Although GoldSim can be used to solve a wide variety of complex problems, it is particularly well-suited (and was originally developed) ...

**15 Facial modeling and animation**

 Jörg Haber, Demetri Terzopoulos

August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**

Publisher: ACM Press

Full text available:  pdf(18.15 MB) Additional Information: [full citation](#), [abstract](#)

In this course we present an overview of the concepts and current techniques in facial modeling and animation. We introduce this research area by its history and applications. As a necessary prerequisite for facial modeling, data acquisition is discussed in detail. We describe basic concepts of facial animation and present different approaches including parametric models, performance-, physics-, and learning-based methods. State-of-the-art techniques such as muscle-based facial animation, mass-s ...

**16 Semiconductor manufacturing: Process equipment modeling: application of cluster tool modeling to a 300 mm fab simulation**

Sameer T. Shikalgar, David Fronckowiak, Edward A. MacNair

December 2003 **Proceedings of the 35th conference on Winter simulation: driving innovation WSC '03**

Publisher: Winter Simulation Conference

Full text available:  pdf(251.58 KB) Additional Information: [full citation](#), [abstract](#), [references](#)



300 mm semiconductor wafer fabrication facilities, like conventional semiconductor fabs, contain many different types of tools. In this paper we discuss a realistic way of representing cluster tools in a simulation model of the entire line. A more realistic representation of cluster tools results in greater accuracy in the output of the simulation model.

17 An approach to modeling labor and machine down time in semiconductor fabrication

Susan S. Baum, Cheryl M. O'Donnell

December 1991 **Proceedings of the 23rd conference on Winter simulation WSC '91**



Publisher: IEEE Computer Society

Full text available: [pdf\(560.31 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



18 A rapid modeling technique for measurable improvements in factory performance

Andreas Peikert, Josef Thoma, Steven Brown

December 1998 **Proceedings of the 30th conference on Winter simulation WSC '98**

Publisher: IEEE Computer Society Press

Full text available: [pdf\(58.62 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



19 Semiconductor manufacturing: Wafer fabrication: 300mm wafer fabrication line simulation model

Sameer T. Shikalgar, David Fronckowiak, Edward A. MacNair

December 2002 **Proceedings of the 34th conference on Winter simulation: exploring new frontiers WSC '02**

Publisher: Winter Simulation Conference

Full text available: [pdf\(147.92 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

The importance of semiconductor wafer fabrication has been increasing steadily over the past decade. Wafer fabrication is the most technologically complex and capital intensive phase in semiconductor manufacturing. It involves the processing of wafers of silicon in order to build up layers and patterns of metal and wafer material. Many operations have to be performed in a clean room environment to prevent particulate contamination of wafers. Also, since the machines on which the wafers are pr ...



20 A model of a 300mm wafer fabrication line

 Philip L. Campbell, Darius Rohan, Edward A. MacNair

December 1999 **Proceedings of the 31st conference on Winter simulation: Simulation--a bridge to the future - Volume 1 WSC '99**

Publisher: ACM Press

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Relevance scale

- 21 Semiconductor manufacturing: Automated material handling systems: automated reticle handling: a comparison of distributed and centralized reticle storage and transport**



Anne M. Murray, David J. Miller

December 2003 **Proceedings of the 35th conference on Winter simulation: driving innovation WSC '03**

Publisher: Winter Simulation Conference

Full text available: [pdf\(308.46 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

The implementation of Automated Material Handling Systems (AMHS) in 300mm semiconductor facilities provides the opportunity to realize significant benefits in fabricator productivity and performance. The leverage associated with automated reticle delivery to photolithography process tools may be less apparent than a fab-wide AMHS. However, a high product mix environment requires the tracking, storage and transportation of thousands of reticles to successfully process wafers on photolithograph ...

- 22 A pollution displacement model for the great lakes system**



Kent S. Butler, William A. Gates, Brent H. McCown

January 1974 **Proceedings of the 7th conference on Winter simulation - Volume 1 WSC '74**

Publisher: ACM Press

Full text available: [pdf\(1.22 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

A pollution displacement model of the Great Lakes system is presented, together with a brief review of previous Great Lakes water balance and pollution displacement models. The DYNAMO II language is utilized in a simulation of historical water balance relationships and a water pollution transport system for dissolved substances in each lake. The model enacts a continuous simulation of some hydrologic and water quality components of each subsystem, while making the concentration of pollutant ...

- 23 Modeling and simulation of material handling for semiconductor wafer fabrication**



Neal G. Pierce, Richard Stafford

December 1994 **Proceedings of the 26th conference on Winter simulation WSC '94**

Publisher: Society for Computer Simulation International

Full text available: [pdf\(691.41 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

24 Dispersion Simulation and Visualization For Urban Security

Feng Qiu, Ye Zhao, Zhe Fan, Xiaoming Wei, Haik Lorenz, Jianning Wang, Suzanne Yoakum-Stover, Arie Kaufman, Klaus Mueller

October 2004 **Proceedings of the conference on Visualization '04 VIS '04**

Publisher: IEEE Computer Society

Full text available:  pdf(545.62 KB) Additional Information: [full citation](#), [abstract](#), [citations](#)

We present a system for simulating and visualizing the propagation of dispersive contaminants with an application to urban security. In particular, we simulate airborne contaminant propagation in open environments characterized by sky-scrapers and deep urban canyons. Our approach is based on the Multiple Relaxation Time Lattice Boltzmann Model (MRTLBM), which can efficiently handle complex boundary conditions such as buildings. In addition, we model thermal effects on the flow field using the hy ...

Keywords: Lattice Boltzmann Model, GPU, Visualization

25 Validation of models: statistical techniques and data availability

 Jack P. C. Kleijnen

December 1999 **Proceedings of the 31st conference on Winter simulation: Simulation--a bridge to the future - Volume 1 WSC '99**

Publisher: ACM Press

Full text available:  pdf(86.11 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

26 A flexible statistical model for CAD of submicrometer analog CMOS integrated circuits

Christopher Michael, Christopher Abel, C. S. Teng

November 1993 **Proceedings of the 1993 IEEE/ACM international conference on Computer-aided design ICCAD '93**

Publisher: IEEE Computer Society Press

Full text available:  pdf(363.42 KB) Additional Information: [full citation](#), [references](#), [citations](#)

27 Supporting semiconductor manufacturing simulation tools using a structured data model



Susan S. Baum, Peter G. Glassey

December 1992 **Proceedings of the 24th conference on Winter simulation WSC '92**

Publisher: ACM Press

Full text available:  pdf(613.47 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

28 Projection-based performance modeling for inter/intra-die variations

Xin Li, Jiayong Le, L. T. Pileggi, A. Strojwas

May 2005 **Proceedings of the 2005 IEEE/ACM International conference on Computer-aided design ICCAD '05**

Publisher: IEEE Computer Society

Full text available:  pdf(312.53 KB) Additional Information: [full citation](#), [abstract](#), [citations](#)

Large-scale process fluctuations in nano-scale IC technologies suggest applying high-order (e.g., quadratic) response surface models to capture the circuit performance variations. Fitting such models requires significantly more simulation samples and solving

much larger linear equations. In this paper, we propose a novel projection-based extraction approach, PROBE, to efficiently create quadratic response surface models and capture both inter-die and intra-die variations with affordable computat ...

29 Construction engineering and project management: Construction engineering and project management I: building a virtual shop model for steel fabrication

Lingguang Song, Simaan M. AbouRizk

December 2003 **Proceedings of the 35th conference on Winter simulation: driving innovation WSC '03**

Publisher: Winter Simulation Conference

Full text available: [pdf\(487.44 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Steel fabrication is a complex process, which encompasses product uniqueness, a high product mix, and a number of activities involving a variety of equipment and labor disciplines. The steel fabrication industry needs advanced tools and techniques in order to estimate, plan, and control fabrication shops. This paper proposes a system for building virtual fabrication shop models capable of estimating, scheduling, and analyze production. The system defines conceptual models for product, process ...

30 Semiconductor manufacturing: Factory capacity and throughput planning: conceptualization, design and implementation of a static capacity model

Orkun Ozturk, Melissa Boom Coburn, Steve Kitterman

December 2003 **Proceedings of the 35th conference on Winter simulation: driving innovation WSC '03**

Publisher: Winter Simulation Conference

Full text available: [pdf\(305.61 KB\)](#) Additional Information: [full citation](#), [abstract](#)

This paper describes the methodology used for development of a static capacity model. It is a well-known fact that no matter how sophisticated the dynamic models are, there is always a need for the simple spreadsheet model. The spreadsheet model helps one carry out simple and fast analyses whenever they are needed. At the Seagate Technology's Recording Head Operations Wafer Manufacturing facility (Bloomington, MN) industrial engineers who worked on capacity planning devised their own versions ...

31 Trapol: A cold-start-sensitive simulation model of traffic-generated air pollution emissions



Brian Laird Crissey

January 1974 **Proceedings of the 7th conference on Winter simulation - Volume 1 WSC '74**

Publisher: ACM Press

Full text available: [pdf\(737.12 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

It should not be a surprise to anyone that the automobile is a primary source of the air pollutants Carbon Monoxide (CO), Hydrocarbons (HC), and Nitrogen Oxides (NOx). The severity of the issue is well documented, and the search for viable solutions to this complex problem is widely publicized, if still hesitant and speculative in nature. The use of computer models for the analysis of air pollution problems, although widespread and increasing, is constrained by a problem of scale ...

32 Distributed computation of wave propagation models using PVM



J. S. Sochacki, D. Mitchum, P. O'Leary, R. E. Ewing, R. C. Sharpley

December 1993 **Proceedings of the 1993 ACM/IEEE conference on Supercomputing Supercomputing '93**

Publisher: ACM Press

Full text available: [pdf\(1.18 MB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

33 [Biological/environmental simulations: biological/environmental simulations: Factors affecting the expectation of casualties in the virtual range toxicity model](#) 

José Sepúlveda, Luis Rabelo, Jaebok Park, Fred Gruber, Oscar Martínez

December 2004 **Proceedings of the 36th conference on Winter simulation WSC '04**

Publisher: Winter Simulation Conference

Full text available: [!\[\]\(9479d69b60a82161c6862eaa53eb4db3_img.jpg\) pdf\(514.52 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

The Virtual Range (VR) is an environment that integrates in a seamless fashion several models to improve complex systems visualization. A complex system is a non-linear system of systems whose interactions bring together interesting emergent properties that are very difficult to visualize and/or study by using the traditional approach of decomposition. The VR Toxicity Model as described here represents the different systems that interact in the determination of the expectation of casualties (E)

34 [e-Rulemaking 2: Locating related regulations using a comparative analysis approach](#) 

 Gloria T. Lau, Haoyi Wang, Kincho H. Law

May 2006 **Proceedings of the 2006 international conference on Digital government research dg.o '06**

Publisher: ACM Press

Full text available: [!\[\]\(5a09a9dfd2f1e923eccb8c24714edf51_img.jpg\) pdf\(611.98 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The sheer volume and complexity of government regulations make any attempt to locate, understand and interpret the information a daunting task. Other factors, such as the scattered distribution of the regulations across many sources, different terminologies and cross referencing, further complicate the technical issues in developing a regulation information management system. This paper describes a comparative analysis approach and its potential application to assist locating relevant regulation ...

Keywords: regulatory comparison, relatedness analysis, structural analysis

35 [GPU Cluster for High Performance Computing](#) 

Zhe Fan, Feng Qiu, Arie Kaufman, Suzanne Yoakum-Stover

November 2004 **Proceedings of the 2004 ACM/IEEE conference on Supercomputing SC '04**

Publisher: IEEE Computer Society

Full text available: [!\[\]\(8b489669e5348baffa74b0cc87030268_img.jpg\) pdf\(793.59 KB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#)

Inspired by the attractive Flops/dollar ratio and the incredible growth in the speed of modern graphics processing units (GPUs), we propose to use a cluster of GPUs for high performance scientific computing. As an example application, we have developed a parallel flow simulation using the lattice Boltzmann model (LBM) on a GPU cluster and have simulated the dispersion of airborne contaminants in the Times Square area of New York City. Using 30 GPU nodes, our simulation can compute a 480x400x80 L ...

Keywords: GPU cluster, data intensive computing, lattice Boltzmann model, urban airborne dispersion, computational fluid dynamics

36 [Semiconductor manufacturing: Modeling methodology: simulation based cause and effect analysis of cycle time and WIP in semiconductor wafer fabrication](#) 

Chao Qi, Tuck Keat Tang, Appa Lyer Sivakumar

December 2002 **Proceedings of the 34th conference on Winter simulation: exploring new frontiers WSC '02**

Publisher: Winter Simulation Conference

Full text available: [!\[\]\(6638a56c686f4e4d5e9e12d5a306d03e_img.jpg\) pdf\(342.01 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Semiconductor wafer fabrication is perhaps one of the most complex manufacturing processes found today. In this paper, we construct a simulation model of part of a wafer fab using ProModel® software and analyze the effect of different input variables on selected parameters, such as cycle time, WIP level and equipment utilization rates. These input variables include arrival distribution, batch size, downtime pattern and lot release control. SEMATECH DATASET which has the original actual wa ...

37 [Semiconductor manufacturing: Modeling methodology: using simulation to understand capacity constraints and improve efficiency on process tools](#)

Manuel Aybar, Kishore Potti, Todd LeBaron

December 2002 **Proceedings of the 34th conference on Winter simulation: exploring new frontiers WSC '02**

Publisher: Winter Simulation Conference

Full text available:  [pdf\(200.15 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Finding hidden capacity and maximizing cluster tool throughput is a common goal for today's semiconductor manufacturers. This presentation will discuss a flexible and accurate simulation program capable of modeling a wide range of semiconductor process tools. The simulation program provides visibility and understanding into the internal dependencies and interactions of each process tool. This information provides a solid base from which sound decisions can be made. Simulation results from two ...

38 [Special issue: AI in engineering](#)

 D. Sriram, R. Joobani

April 1985 **ACM SIGART Bulletin**, Issue 92

Publisher: ACM Press

Full text available:  [pdf\(8.79 MB\)](#) Additional Information: [full citation](#), [abstract](#)

The papers in this special issue were compiled from responses to the announcement in the July 1984 issue of the SIGART newsletter and notices posted over the ARPAnet. The interest being shown in this area is reflected in the sixty papers received from over six countries. About half the papers were received over the computer network.

39 [Research sessions: spatial data: Spatially-decaying aggregation over a network: model and algorithms](#)

 Edith Cohen, Haim Kaplan

June 2004 **Proceedings of the 2004 ACM SIGMOD international conference on Management of data SIGMOD '04**

Publisher: ACM Press

Full text available:  [pdf\(358.49 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Data items are often associated with a location in which they are present or collected, and their relevance or influence decays with their distance. Aggregate values over such data thus depend on the observing location, where the weight given to each item depends on its distance from that location. We term such aggregation *spatially-decaying*. Spatially-decaying aggregation has numerous applications: Individual sensor nodes collect readings of an environmental parameter such as contaminatio ...

40 [The challenges of visualizing and modeling environmental data](#)

Yingcai Xiao, John P. Ziebarth, Chuck Woodbury, Eric Bayer, Bruce Rundell, Jeroen van der Zijp

October 1996 **Proceedings of the 7th conference on Visualization '96 VIS '96**

Publisher: IEEE Computer Society Press

Full text available:  [pdf\(5.00 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

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Relevance scale

41 Web based collaborative visualization of distributed and parallel simulation

C. Bajaj, S. Cutchin

 October 1999 **Proceedings of the 1999 IEEE symposium on Parallel visualization and graphics PVGS '99**
Publisher: ACM PressFull text available: [pdf\(1.56 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents an interaction model to support collaborative scientific visualization. Relevant prior work is presented to contextualize the model and its import. An implementation of the model is presented within a collaborative system that supports flexible collaborative coupling of multi-user applications. An example application is presented to demonstrate the capabilities of the model. The implementation is Web based, fully supports multi-user interfaces, uses VRML and compressed VR ...

42 Homeland security/emergency response: simulation for emergency management:
Responding to terrorist attacks and natural disasters: a case study using simulation

Pavel Albores, Duncan Shaw

December 2005 **Proceedings of the 37th conference on Winter simulation WSC '05****Publisher:** Winter Simulation ConferenceFull text available: [pdf\(320.76 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

The heightened threat of terrorism has caused governments worldwide to reconsider their plans for responding in the immediate aftermath to large-scale catastrophic incidents. This paper discusses the use of discrete event simulation modeling to understand how a Fire Service might position its resources before an attack takes place, to best respond to a combination of different attacks at different locations if they happen. Two models are built for this purpose. The first model deals with mass de ...

43 Level set and PDE methods for computer graphics

David Breen, Ron Fedkiw, Ken Museth, Stanley Osher, Guillermo Sapiro, Ross Whitaker

August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04****Publisher:** ACM PressFull text available: [pdf\(17.07 MB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#)

Level set methods, an important class of partial differential equation (PDE) methods, define dynamic surfaces implicitly as the level set (iso-surface) of a sampled, evolving nD function. The course begins with preparatory material that introduces the concept of using

partial differential equations to solve problems in computer graphics, geometric modeling and computer vision. This will include the structure and behavior of several different types of differential equations, e.g. the level set eq ...

44 Object identity and dimension alignment in parametric databases 

 Tsz S. Cheng, Shashi K. Gadia, Sunil S. Nair

December 1993 **Proceedings of the second international conference on Information and knowledge management CIKM '93**

Publisher: ACM Press

Full text available:  pdf(1.08 MB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

45 Special section on sensor network technology and sensor data management: An environmental sensor network to determine drinking water quality and security 

 Anastassia Ailamaki, Christos Faloutsos, Paul S. Fischbeck, Mitchell J. Small, Jeanne VanBriesen

December 2003 **ACM SIGMOD Record**, Volume 32 Issue 4

Publisher: ACM Press

Full text available:  pdf(72.40 KB)

Additional Information: [full citation](#), [abstract](#), [references](#)

Finding patterns in large, real, spatio/temporal data continues to attract high interest (e.g., sales of products over space and time, patterns in mobile phone users; sensor networks collecting operational data from automobiles, or even from humans with wearable computers). In this paper, we describe an interdisciplinary research effort to couple knowledge discovery in large environmental databases with biological and chemical sensor networks, in order to revolutionize drinking water quality and ...

46 The simulation of integrated tool performance in semiconductor manufacturing 

 John L. Mauer, Roland E. A. Schelasin

December 1993 **Proceedings of the 25th conference on Winter simulation WSC '93**

Publisher: ACM Press

Full text available:  pdf(387.17 KB)

Additional Information: [full citation](#), [references](#), [citations](#)

47 Aerospace and military applications: simulation in aerospace II: distributed simulations: Usability study of the virtual test bed and distributed simulation 

Jeffrey W. Dawson, Ping Chen, Yanshen Zhu

December 2005 **Proceedings of the 37th conference on Winter simulation WSC '05**

Publisher: Winter Simulation Conference

Full text available:  pdf(197.49 KB)

Additional Information: [full citation](#), [abstract](#), [references](#)

Improving the usability of a Distributed Simulation System (DSS) test bed is the focus of this paper. An introduction to the field of usability is given, followed by a discussion of the characteristics of DSSs. Then the usability of DSSs is considered. The Virtual Test Bed (VTB), a sample DSS we have improved the usability of, is described. The methodology used to improve the VTB's usability is given. With the goal of improving usability for end users, proto-typing of a graphical user interface ...

48 Linking TCAD to EDA—benefits and issues 

 G. Chin, W. Dietrich, D. Boning, A. Wong, A. Neureuther, R. Dutton

June 1991 **Proceedings of the 28th conference on ACM/IEEE design automation DAC '91**

Publisher: ACM Press

Full text available: [pdf\(774.94 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

49 Detailed simulation for semiconductor manufacturing 

Robert W. Atherton, Linda F. Atherton, Mark A. Pool

December 1990 **Proceedings of the 22nd conference on Winter simulation WSC' 90**

Publisher: IEEE Press

Full text available: [pdf\(500.98 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

50 Manufacturing applications: Neutral information structure for manufacturing simulations: designing reusable simulation modules for electronics manufacturing systems 

Phani S. Mukkamala, Jeffrey S. Smith, Jorge F. Valenzuela

December 2003 **Proceedings of the 35th conference on Winter simulation: driving innovation WSC '03**

Publisher: Winter Simulation Conference

Full text available: [pdf\(449.49 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Developing simulation models for related problems in the same domain is generally a repetitive process. Such simulation models are similar in many aspects and have only minor differences. Modeling efforts can be reduced to a great extent through the development of domain specific modules or templates that encapsulate the domain-specific logic and hide many of the modeling details. This paper describes the development of such a domain-specific template for electronics assembly. In particular, ...

51 Hanford solid waste management system simulation 

Steven R. Shaver, Lorna L. Armacost, Heidi S. Konynenbelt, Robert R. Wehrman

December 1994 **Proceedings of the 26th conference on Winter simulation WSC '94**

Publisher: Society for Computer Simulation International

Full text available: [pdf\(529.05 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

52 Semiconductor manufacturing: Automated material handling systems: a simulation-based design framework for automated material handling systems in 300mm fabrication facilities 

Dima Nazzal, Douglas A. Bodner

December 2003 **Proceedings of the 35th conference on Winter simulation: driving innovation WSC '03**

Publisher: Winter Simulation Conference

Full text available: [pdf\(362.35 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

This paper describes a methodology to tackle the problem of designing Automated Material Handling Systems (AMHS) for 300mm wafer fabrication facilities. The proposed framework divides the design process into two levels: architectural and elaborative. Prior to the design, fab data are preprocessed using simulation of manufacturing operations. The output data and fab requirements data are then profiled to aid in design decision making at the architectural level. Once architectural design decisi ...

53 3D geometric simulation of MEMS fabrication processes: a semantic approach 

 Hrishikesh Dixit, Srikanth Kannapan, Dean L. Taylor

May 1997 **Proceedings of the fourth ACM symposium on Solid modeling and**

applications SMA '97**Publisher:** ACM PressFull text available:  pdf(1.43 MB) Additional Information: [full citation](#), [references](#), [index terms](#)

- 54 [Layered manufacturing as a graphics display device: Layered manufacturing as a graphics display device](#) 

 Sara McMains, Mike Bailey, Richard Crawford
July 2005 **ACM SIGGRAPH 2005 Courses SIGGRAPH '05**

Publisher: ACM PressFull text available:  pdf(7.33 MB) Additional Information: [full citation](#)

- 55 [Semiconductor manufacturing: Alternative loading and dispatching policies for furnace operations in semiconductor manufacturing: a comparison by simulation](#) 

Elif Akçali, Reha Uzsoy, David G. Hiscock, Anne L. Moser, Timothy J. Teyner
December 2000 **Proceedings of the 32nd conference on Winter simulation WSC '00**

Publisher: Society for Computer Simulation InternationalFull text available:  pdf(497.51 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

In semiconductor manufacturing, furnaces are used for diffusion and deposition operations. A furnace is a batch processing machine, which can simultaneously process a number of lots together as a batch. Whenever a furnace becomes available, scheduling the next batch involves decisions on both which operation to process next (dispatching policy) and how many lots to put into the batch (loading policy). A simulation model of a wafer fabrication facility is used to examine the effects of different ...

- 56 [Reticle enhancement technology trends: resource and manufacturability implications for the implementation of physical designs](#) 

 Warren Grobman, Robert Boone, Cece Philbin, Bob Jarvis
April 2001 **Proceedings of the 2001 international symposium on Physical design ISPD '01**

Publisher: ACM PressFull text available:  pdf(510.15 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper, we briefly describe the lithography developments known as RET (Resolution Enhancement Technologies), which include off-axis illumination in litho tools, Optical and Process Correction (OPC), and phase shifting masks (PSM). All of these techniques are adopted to allow ever smaller features to be reliably manufactured, and are being generally adopted in all manufacturing below 0.25 microns. However, their adoption also places certain restrictions on layouts. We explore these res ...

- 57 [BioMEMS: Design tools for BioMEMS](#) 

 Tom Korsmeyer, Jun Zeng, Ken Greiner
June 2004 **Proceedings of the 41st annual conference on Design automation DAC '04**

Publisher: ACM PressFull text available:  pdf(852.47 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Microsystems used for chemical analyses and biological assays are termed BioMEMS or labs-on-a-chip. These systems often require some of the traditional electromechanical capabilities of MEMS, and in addition require the manipulation of fluids in either continuous flow or droplet form. The distinction between continuous flow and droplets defines two broad categories of BioMEMS. Different applications call for one or the other of these

approaches, but in either case, software for design and simulation c ...

Keywords: BEM, BioMEMS, CAD, FEM, MEMS, PTAS, lab-on-a-chip, system-level modeling

58 Reflectance and texture of real-world surfaces

 Kristin J. Dana, Bram van Ginneken, Shree K. Nayar, Jan J. Koenderink
January 1999 **ACM Transactions on Graphics (TOG)**, Volume 18 Issue 1

Publisher: ACM Press

Full text available:  pdf(6.94 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this work, we investigate the visual appearance of real-world surfaces and the dependence of appearance on the geometry of imaging conditions. We discuss a new texture representation called the BTF (bidirectional texture function) which captures the variation in texture with illumination and viewing direction. We present a BTF database with image textures from over 60 different samples, each observed with over 200 different combinations of viewing and illumination directions. We describe ...

59 An impact analysis method for safety-critical user interface design

 Julia Galliers, Alistair Sutcliffe, Shailey Minocha
December 1999 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 6 Issue 4

Publisher: ACM Press

Full text available:  pdf(248.35 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

We describe a method of assessing the implications for human error on user interface design of safety-critical systems. In previous work we have proposed a taxonomy of influencing factors that contribute to error. In this article, components of the taxonomy are combined into a mathematical and causal model for error, represented as a Bayesian Belief Net (BBN). The BBN quantifies error influences arising from user knowledge, ability, and the task environment, combined with factors describin ...

Keywords: Bayesian belief networks, human error, safety-critical, scenario-based causal analysis

60 Effective implementation of cycle time reduction strategies for semiconductor backend manufacturing

Joerg Domaschke, Steven Brown, Jennifer Robinson, Franz Leibl
December 1998 **Proceedings of the 30th conference on Winter simulation WSC '98**

Publisher: IEEE Computer Society Press

Full text available:  pdf(87.67 KB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

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1 [Dynamic data driven application simulation: sensor/simulation fusion: DDDAS approaches to wildland fire modeling and contaminant tracking](#)

Craig C. Douglas, Robert A. Lodder, Richard E. Ewing, Yalchin Efendiev, Guan Qin, Janice Coen, Mauricio Kritz, Jonathan D. Beezley, Jan Mandel, Mohamed Iskandarani, Anthony Vodacek, Gundolf Haase

December 2006 **Proceedings of the 37th conference on Winter simulation WSC '06**

Publisher: Winter Simulation Conference

Full text available: [pdf\(203.65 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

We report on two ongoing efforts to build Dynamic Data Driven Application Systems (DDDAS) for (1) short-range forecasting of weather and wildfire behavior from real time weather data, images, and sensor streams, and (2) contaminant identification and tracking in water bodies. Both systems change their forecasts as new data is received. We use one long term running simulation that self corrects using out of order, imperfect sensor data. The DDDAS versions replace codes that were previously run us ...

2 [Facial modeling and animation](#)

Jörg Haber, Demetri Terzopoulos

August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**

Publisher: ACM Press

Full text available: [pdf\(18.15 MB\)](#) Additional Information: [full citation](#), [abstract](#)

In this course we present an overview of the concepts and current techniques in facial modeling and animation. We introduce this research area by its history and applications. As a necessary prerequisite for facial modeling, data acquisition is discussed in detail. We describe basic concepts of facial animation and present different approaches including parametric models, performance-, physics-, and learning-based methods. State-of-the-art techniques such as muscle-based facial animation, mass-s ...

3 [Level set and PDE methods for computer graphics](#)

David Breen, Ron Fedkiw, Ken Museth, Stanley Osher, Guillermo Sapiro, Ross Whitaker

August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**

Publisher: ACM Press

Full text available: [pdf\(17.07 MB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#)

Level set methods, an important class of partial differential equation (PDE) methods, define dynamic surfaces implicitly as the level set (iso-surface) of a sampled, evolving nD function. The course begins with preparatory material that introduces the concept of using

partial differential equations to solve problems in computer graphics, geometric modeling and computer vision. This will include the structure and behavior of several different types of differential equations, e.g. the level set eq ...

4 Methods for a priori feasible layout generation: Optical proximity correction (OPC): friendly maze routing

 Li-Da Huang, Martin D. F. Wong
June 2004 **Proceedings of the 41st annual conference on Design automation DAC '04**

Publisher: ACM Press

Full text available:  pdf(541.55 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

As the technology migrates into the deep submicron manufacturing(DSM) era, the critical dimension of the circuits is getting smaller than the lithographic wavelength. The unavoidable light diffraction phenomena in the sub-wavelength technologies have become one of the major factors in the yield rate. Optical proximity correction (OPC) is one of the methods adopted to compensate for the light diffraction effect as a post layout process. However, the process is time-consuming and the results are st ...

Keywords: OPC, VLSI, manufacturing, maze routing, micro-lithography, optical system

5 Reflectance and texture of real-world surfaces

 Kristin J. Dana, Bram van Ginneken, Shree K. Nayar, Jan J. Koenderink
January 1999 **ACM Transactions on Graphics (TOG)**, Volume 18 Issue 1

Publisher: ACM Press

Full text available:  pdf(6.94 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this work, we investigate the visual appearance of real-world surfaces and the dependence of appearance on the geometry of imaging conditions. We discuss a new texture representation called the BTF (bidirectional texture function) which captures the variation in texture with illumination and viewing direction. We present a BTF database with image textures from over 60 different samples, each observed with over 200 different combinations of viewing and illumination directions. We describe ...

6 Yield modeling and BEOL fundamentals

 José Pineda de Gyvez
March 2001 **Proceedings of the 2001 international workshop on System-level interconnect prediction SLIP '01**

Publisher: ACM Press

Full text available:  pdf(850.38 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The advent of deep submicron technologies with larger die sizes lends itself to an increase in fabrication cost. An appropriate yield forecast renders significant benefits in both time-to-market and manufacturing cost prediction. Yield forecasting is essential for the development of new products as it effectively shows if a design is feasible of meeting its cost objectives or not. In mature manufacturing processes, spot defects are the main detractors in the successful outcome of an IC. The ...

7 Subwavelength optical lithography: challenges and impact on physical design

 A. B. Kahng, Y. C. Pati
April 1999 **Proceedings of the 1999 international symposium on Physical design ISPD '99**

Publisher: ACM Press

Full text available: [pdf\(1.30 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

8 Architectural implications of quantum computing technologies

 Rodney Van Meter, Mark Oskin

January 2006 **ACM Journal on Emerging Technologies in Computing Systems (JETC)**,

Volume 2 Issue 1

Publisher: ACM Press

Full text available: [pdf\(3.24 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this article we present a classification scheme for quantum computing technologies that is based on the characteristics most relevant to computer systems architecture. The engineering trade-offs of execution speed, decoherence of the quantum states, and size of systems are described. Concurrency, storage capacity, and interconnection network topology influence algorithmic efficiency, while quantum error correction and necessary quantum state measurement are the ultimate drivers of logical clo ...

Keywords: Quantum computing, quantum computer architecture

9 BioMEMS: Design tools for BioMEMS

 Tom Korsmeyer, Jun Zeng, Ken Greiner

June 2004 **Proceedings of the 41st annual conference on Design automation DAC '04**

Publisher: ACM Press

Full text available: [pdf\(852.47 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Microsystems used for chemical analyses and biological assays are termed BioMEMS or labs-on-a-chip. These systems often require some of the traditional electromechanical capabilities of MEMS, and in addition require the manipulation of fluids in either continuous flow or droplet form. The distinction between continuous flow and droplets defines two broad categories of BioMEMS. Different applications call for one or the other of these approaches, but in either case, software for design and simulation c ...

Keywords: BEM, BioMEMS, CAD, FEM, MEMS, PTAS, lab-on-a-chip, system-level modeling

10 Poster session III: Multilevel full-chip gridless routing considering optical proximity correction

 Tai-Chen Chen, Yao-Wen Chang

January 2005 **Proceedings of the 2005 conference on Asia South Pacific design automation ASP-DAC '05**

Publisher: ACM Press

Full text available: [pdf\(374.57 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

To handle modern routing with nanometer effects, we need to consider designs of variable wire widths and spacings, for which gridless routers are desirable due to their great flexibility. The gridless routing is much more difficult than the grid-based one because the solution space of gridless routing is significantly larger than that of grid-based one. In this paper, we present the first multilevel, full-chip gridless detailed router. The router integrates global routing, detailed ...

11 Semiconductor manufacturing: tool control: An analysis: traditional semiconductor lithography versus emerging technology (nano imprint)

Walt Trybula, Robert L. Wright, Kranthi Mitra Adusumilli, Randy K. Goodall

December 2005 Proceedings of the 37th conference on Winter simulation WSC '05**Publisher:** Winter Simulation ConferenceFull text available: [pdf\(313.28 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

The introduction of emerging technologies into existing manufacturing facilities is not necessarily encouraged by the people responsible for the output of the facilities. Any "new" technology carries risks and people responsible for delivering manufactured products are, by nature, risk-adverse. This paper demonstrates the advantage of evaluating the impact of attempting to introduce a new technology into an existing facility before actually attempting the introduction. The first part of the anal ...

12 GPU Cluster for High Performance Computing

Zhe Fan, Feng Qiu, Arie Kaufman, Suzanne Yoakum-Stover

November 2004 **Proceedings of the 2004 ACM/IEEE conference on Supercomputing SC '04****Publisher:** IEEE Computer SocietyFull text available: [pdf\(793.59 KB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#)

Inspired by the attractive Flops/dollar ratio and the incredible growth in the speed of modern graphics processing units (GPUs), we propose to use a cluster of GPUs for high performance scientific computing. As an example application, we have developed a parallel flow simulation using the lattice Boltzmann model (LBM) on a GPU cluster and have simulated the dispersion of airborne contaminants in the Times Square area of New York City. Using 30 GPU nodes, our simulation can compute a 480x400x80 L ...

Keywords: GPU cluster, data intensive computing, lattice Boltzmann model, urban airborne dispersion, computational fluid dynamics

13 Transistor Flaring in Deep Submicron-Design Considerations

Vipul Singhal, C. B. Keshav, K. G. Surnanth, P. ... R. Suresh

January 2002 **Proceedings of the 2002 conference on Asia South Pacific design automation/VLSI Design ASP-DAC '02****Publisher:** IEEE Computer SocietyFull text available: [pdf\(1.00 MB\)](#) [Publisher Site](#) Additional Information: [full citation](#)

Keywords: Design for Manufacturability (DFM), Deep Submicron (DSM), pullback, photolithography, Subwavelength-lithography, Optical Proximity Correction (OPC), SPICE-models, standard-cell library.

14 Reticle enhancement technology trends: resource and manufacturability implications for the implementation of physical designs

Warren Grobman, Robert Boone, Cece Philbin, Bob Jarvis

April 2001 **Proceedings of the 2001 international symposium on Physical design ISPD '01****Publisher:** ACM PressFull text available: [pdf\(510.15 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper, we briefly describe the lithography developments known as RET (Resolution Enhancement Technologies), which include off-axis illumination in litho tools, Optical and Process Correction (OPC), and phase shifting masks (PSM). All of these techniques are adopted to allow ever smaller features to be reliably manufactured, and are being

generally adopted in all manufacturing below 0.25 microns. However, their adoption also places certain restrictions on layouts. We explore these res ...

15 Reticle enhancement technology: implications and challenges for physical design

 W. Grobman, M. Thompson, R. Wang, C. Yuan, R. Tian, E. Demircan

June 2001 **Proceedings of the 38th conference on Design automation DAC '01**

Publisher: ACM Press

Full text available: .pdf(228.37 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper, we review phase shift lithography, rule vs. model based methods for OPC and model-based tiling, and discuss their implications for layout and verification. We will discuss novel approaches, using polarizing films on reticles, which change the game for phase-shift coloring, and could lead to a new direction in c:PSM constraints on physical design. We emphasize the need to do tiling that is model-driven and uses optimization techniques to achieve planarity for better manufac ...

Keywords: OPC, PSM, RET, mask data preparation, optical proximity correction, reticle enhancement technology, subwavelength lithography, tiling

16 Subwavelength lithography and its potential impact on design and EDA

 Andrew B. Kahng, Y. C. Pati

June 1999 **Proceedings of the 36th ACM/IEEE conference on Design automation DAC '99**

Publisher: ACM Press

Full text available: .pdf(188.93 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

17 Layered manufacturing as a graphics display device: Layered manufacturing as a graphics display device

 Sara McMains, Mike Bailey, Richard Crawford

July 2005 **ACM SIGGRAPH 2005 Courses SIGGRAPH '05**

Publisher: ACM Press

Full text available: .pdf(7.33 MB) Additional Information: [full citation](#)

18 The simulation of integrated tool performance in semiconductor manufacturing

 John L. Mauer, Roland E. A. Schelasin

December 1993 **Proceedings of the 25th conference on Winter simulation WSC '93**

Publisher: ACM Press

Full text available: .pdf(387.17 KB) Additional Information: [full citation](#), [references](#), [citations](#)

19 The neXT computer

 T. Dietrich

August 1989 **ACM SIGSMALL/PC Notes**, Volume 15 Issue 3

Publisher: ACM Press

Full text available: .pdf(1.04 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

What's NeXT? NeXT is Steve Jobs. In September of 1985 Jobs was stripped of his authority at the very company he and his friend Steve Wozniak had created - Apple Computer, Inc. Apple Computer, one of the most successful computer companies ever, is

viewed by many as *the company that got the personal computer industry rolling*. In fact, Apple's first computer, the Apple 1, was introduced in 1976' - almost six years before IBM introduced its infamous PC.

20 [Impact of RET on physical layouts](#)



 Franklin M. Schellenberg, Luigi Capodieci

April 2001 **Proceedings of the 2001 international symposium on Physical design ISPD '01**

Publisher: ACM Press

Full text available:  [A.pdf\(238.06 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we briefly describe the lithography developments known as RET (Resolution Enhancement Technologies), which include off-axis illumination in litho tools, Optical and Process Correction (OPC), and phase shifting masks (PSM). All of these techniques are adopted to allow ever smaller features to be reliably manufactured, and are being generally adopted in all manufacturing below 0.25 microns. However, their adoption also places certain restrictions on layouts. We explore these re ...

Keywords: DFM, OPC, PSM, RET, lithography, off-axis illumination, phase-shifting, physical verification, simulation

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21 Applications: LaserSPECks: laser SPECtroscopic trace-gas sensor networks -**[sensor integration and applications](#)**

Stephen So, Farinaz Koushanfar, Anatoliy Kosterev, Frank Tittel

April 2007 **Proceedings of the 6th international conference on Information processing in sensor networks IPSN '07****Publisher:** ACM PressFull text available: [pdf\(437.15 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We introduce a novel laser spectroscopic trace-gas sensor platform, LaserSPECks that integrates recently developed miniature quartz-enhanced photoacoustic spectroscopy (QE-PAS) gas sensing technology. This universal platform uses infrared laser spectroscopy detect and quantify numerous gas species at part-per-million to part-per-billion (ppm-ppb) concentrations [2]. Traditional gas sensing devices capable of the same sensitivity and specificity are several orders of magnitude larger in size, ...

Keywords: lasers, sensors, spectroscopy, trace gas sensing**22 Design technology productivity in the DSM era (invited talk)**

Andrew B. Kahng

January 2001 **Proceedings of the 2001 conference on Asia South Pacific design automation ASP-DAC '01****Publisher:** ACM PressFull text available: [pdf\(126.72 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Future requirements for design technology are always uncertain due to changes in process technology, system implementation platforms, and applications markets. To correctly identify the design technology need, and to deliver this technology at the right time, the design technology community - commercial vendors, captive CAD organizations, and academic researchers - must focus on improving design technology time-to-market and quality-of-result. Put another way, we must address the well-known ...

23 Layout design methodologies for sub-wavelength manufacturing

Michael L. Rieger, Jeffrey P. Mayhew, Sridhar Panchapakesan

June 2001 **Proceedings of the 38th conference on Design automation DAC '01****Publisher:** ACM PressFull text available: Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index](#)

[pdf\(705.30 KB\)](#)[terms](#)

In this paper, we describe new types of layout design constraints needed to effectively leverage advanced optical wafer lithography techniques. Most of these constraints are dictated by the physics of advanced lithography processes, while other constraints are imposed by new photomask techniques. Among the methods discussed are 1) phase shift mask (PSM) lithography in which phase information is placed to the photomask in combination with conventional clear and dark information; 2) optical p ...

Keywords: OPC, PSM, lithography, optical proximity correction, phase shift mask

24 Adoption of OPC and the impact on design and layout

 F. M. Schellenberg, Olivier Toublan, Luigi Capodieci, Bob Socha

June 2001 **Proceedings of the 38th conference on Design automation DAC '01**

Publisher: ACM Press

Full text available: [pdf\(574.58 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

With the adoption of various combinations of resolution enhancement techniques (RET) for IC lithography, different process constraints are placed on the IC layout. The final layout used for mask production is dramatically different than the original designer's intent. To insure that EDA tools developed for applying RET techniques can have optimal performance, layout methodology must change to create a true "target" layer that represents the actual design intent. Verification of ...

Keywords: OAI, OPC, PSM, Quasar, RET, SRAF, lithography, off-axis illumination, phase-shifting, quadrupole, scattering bars

25 Embedded hardware design case studies: Design techniques for sensor appliances: foundations and light compass case study

 Jennifer L. Wong, Seapahn Megerian, Miodrag Potkonjak

June 2003 **Proceedings of the 40th conference on Design automation DAC '03**

Publisher: ACM Press

Full text available: [pdf\(454.79 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We propose the first systematic, sensor-centric approach for quantitative design of sensor network appliances. We demonstrate its use by designing light appliance devices and the associated middleware. We have developed five models which are required to make this problem tractable and to undertake the challenging task of designing light sensor appliances: (i) physical world, (ii) light sensor, (iii) physical phenomenon, (iv) appliance design, and (v) computational model. With these models in place ...

Keywords: sensor appliances, sensor networks

26 Analysis of actual fault mechanisms in CMOS logic gates

 Glenn R. Case

June 1976 **Proceedings of the 13th conference on Design automation DAC '76**

Publisher: ACM Press

Full text available: [pdf\(493.98 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

An analysis of failure modes in CMOS logic gates is presented. An example 3-input NAND gate is analyzed in detail and the ramifications of its failure modes are discussed.

27 Poster session II: CMP aware shuttle mask floorplanning

 Gang Xu, Ruiqi Tian, David Z. Pan, Martin D. F. Wong

January 2005 **Proceedings of the 2005 conference on Asia South Pacific design automation ASP-DAC '05**

Publisher: ACM Press

Full text available:  pdf(354.46 KB) Additional Information: [full citation](#), [abstract](#), [references](#)

By putting different chips on the same mask, shuttle mask (or multiple project wafer) provides an economical solution for low volume designs and design prototypes to share the rising mask cost. A challenging floorplanning problem is to optimally pack these chips according to objectives and constraints related to cost and manufacturability. In this paper, we study the problem of CMP aware shuttle mask floorplanning, which is formulated as a rectangle packing problem with objectives of area and po ...

28 Electron beam lithography

Faik S. Ozdemir

June 1979 **Proceedings of the 16th Conference on Design automation DAC '79**

Publisher: IEEE Press

Full text available:  pdf(990.53 KB) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Electron beam lithography is a rapidly maturing technology that has opened the realm of submicron design to the semiconductor device and circuit designer. This improved pattern resolution has already yielded devices and circuits exhibiting higher density, higher operating frequency, and lower operating power than has been possible with other lithography methods. This paper discusses electron beam lithography and the devices and circuits that have been fabricated with this technology.

29 Simulation-based scheduling: simulation-based scheduling I: Pareto control in multi-objective dynamic scheduling of a stepper machine in semiconductor wafer fabrication

Amit Kumar Gupta, Appa Iyer Sivakumar

December 2006 **Proceedings of the 37th conference on Winter simulation WSC '06**

Publisher: Winter Simulation Conference

Full text available:  pdf(218.98 KB) Additional Information: [full citation](#), [abstract](#), [references](#)

This paper focuses on Pareto control in multi-objective dynamic scheduling of a stepper machine that is considered as a bottleneck machine in the semiconductor wafer fabrication process. We propose the use of compromise programming method for achieving Pareto control in the needs of conflicting objectives such as mean cycle time, cycle time variance and maximum tardiness. Using conjunctive simulated scheduling, at each decision instance in simulated time, a Pareto job is selected and loaded on t ...

30 Data collection and evaluation II: Text on tap: the ACL/DCI

Mark Liberman

October 1989 **Proceedings of the workshop on Speech and Natural Language HLT '89**

Publisher: Association for Computational Linguistics

Full text available:  pdf(994.31 KB) Additional Information: [full citation](#), [abstract](#), [citations](#)

There has been a recent upsurge of interest in computational studies of large bodies of text. The aim of such studies varies widely, from lexicography and studies of language change to automatic indexing methods and statistical models for improving the performance of speech recognition systems and optical character readers. In general, corpus-based studies are critical for the development of adequate models of linguistic structure and for insights into the nature of language use. However, resear ...

31 Fabricating arrays of strings

J. Richard Bradley, Steven S. Skiena
January 1997 **Proceedings of the first annual international conference on Computational molecular biology RECOMB '97**

Publisher: ACM Press

Full text available: [pdf\(1.28 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

32 Session 7: Lithography and Routing: What's Next? (invited): Research directions for coevolution of rules and routers

Andrew B. Kahng
April 2003 **Proceedings of the 2003 international symposium on Physical design ISPD '03**

Publisher: ACM Press

Full text available: [pdf\(82.48 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Design rules in advanced IC manufacturing processes are increasingly problematic for modern router architectures and algorithms. This paper first reviews types and causes of "difficult" design rules, as well as implications for current routing approaches. Next, some basic router components are assessed with respect to future viability. Last, the paper discusses prospects for future "coevolution" of design rules and detailed routing methods.

33 Surface modification tools in a virtual environment interface to a scanning probe microscope

Mark Finch, Vernon L. Chi, Russell M. Taylor, Mike Falvo, Sean Washburn, Richard Superfine
April 1995 **Proceedings of the 1995 symposium on Interactive 3D graphics SI3D '95**

Publisher: ACM Press

Full text available: [pdf\(3.87 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The NanoManipulator system has been expanded from a virtual-reality interface for a specific scanning tunneling microscope to include control of atomic force microscopes. The current state of the system is reviewed, and new tools extending the user's feel and control in manipulation and fabrication in the mesoscopic regime are detailed. Manipulations that could not be performed using the techniques available from commercial SPM systems are demonstrated, and the direction of ongoing research ...

Keywords: atomic force microscopy, force, haptic, interactive graphics, scanning tunneling microscopy, scientific visualization, teleoperation, telepresence, virtual worlds

34 Focusing on user-to-product relationships: GMS: preserving multiple expert voices in scientific knowledge management

Adria H. Liszka, William A. Stubblefield, Stephen D. Kleban
June 2003 **Proceedings of the 2003 conference on Designing for user experiences DUX '03**

Publisher: ACM Press

Full text available: [pdf\(401.55 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Computer archives of scientific and engineering knowledge must insure the accuracy, completeness, and validity of their contents. Unfortunately, designers of these sites often overlook the social and cognitive context of scientific activity in favor of highly distilled collections of theoretical findings and technical data, divorcing scientific information from its human origins. Contextual aspects of knowledge seldom find their way into journals and other scientific forums, yet they often reveal ...

Keywords: cognitive psychology, ethnography, expert communities, information architecture, interaction design, knowledge design, scientific knowledge management, user interface design

35 Optics: lighting the way to EDA riches?: A fast optical propagation technique for modeling micro-optical systems

Kurzweg P. Kurzweg, Steven P. Levitan, Jose A. Martinez, Kahrs Kahrs, Donald M. Chiarulli
June 2002 **Proceedings of the 39th conference on Design automation DAC '02**

Publisher: ACM Press

Full text available: [pdf\(245.71 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

As designers become more aggressive in introducing optical components to micro-systems, rigorous optical models are required for system-level simulation tools. Common optical modeling techniques and approximations are not valid for most optical micro-systems, and those techniques that provide accurate simulation are computationally slow. In this paper, we introduce an angular frequency optical propagation technique that greatly reduces computation time while achieving the accuracy of a full scal ...

Keywords: CAD, angular spectrum, optical MEMS, optical micro-systems, optical propagation

36 Interconnect technology evaluation: Modeling of the performance of carbon nanotube bundle, cu/low-k and optical on-chip global interconnects

Hoyeon Cho, Kyung-Hoae Koo, Pawan Kapur, Krishna C. Saraswat
March 2007 **Proceedings of the 2007 international workshop on System level interconnect prediction SLIP '07**

Publisher: ACM Press

Full text available: [pdf\(468.31 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this work, we have quantified and compared the performance of carbon nanotube (CNT) and optical interconnects with the existing technology of Cu/low-K interconnects for future high-performance ICs. We present these comparisons not only in terms of commonly used metrics such as latency and power dissipation, but also compare them using important compound performance metrics, such as, bandwidth density per latency per power. We find that the optical interconnect has the lowest latency for gl ...

Keywords: Cu, Global interconnects, bandwidth density, carbon nanotube, latency, optics, power

37 Dimensioning optical networks under traffic growth models

Tapan Kumar Nayak, Kumar N. Sivarajan
December 2003 **IEEE/ACM Transactions on Networking (TON)**, Volume 11 Issue 6

Publisher: IEEE Press

Full text available: [pdf\(899.24 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we consider the problem of dimensioning a large optical wavelength-division multiplexing (WDM) network assuming the traffic is growing over time. Traffic between pairs of nodes is carried through lightpaths which are high-bandwidth end-to-end circuits, occupying a wavelength on each link of the path between two nodes. We are interested in dimensioning the WDM links so that the first lightpath request rejection will occur, with high probability, after a specified period of time ...

Keywords: capacity allocation, capacity exhaustion probability, stochastic modeling, traffic growth model

38 Concepts of computer-based modeling for consultation in optics and refraction C. A. Kulikowski, A. SafirOctober 1976 **Proceedings of the annual conference ACM 76****Publisher:** ACM PressFull text available:  pdf(551.43 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper we discuss general principles of computer science applied to problems of medical consultation. We describe some of the design considerations for a computer-based consultation program in optics and refraction. Since the visual system is the input pathway for most of the data entering the central nervous system, the process of refraction serves important purposes beyond the generation of a prescription for a pair of eyeglasses. Refraction, the measurement and correction of optic ...

39 Modeling the lot selection process in semiconductor photolithography processing Thomas C. McGuiganDecember 1992 **Proceedings of the 24th conference on Winter simulation WSC '92****Publisher:** ACM PressFull text available:  pdf(351.05 KB) Additional Information: [full citation](#), [references](#), [index terms](#)**40 High-level model of a WDMA passive optical bus for a reconfigurable multiprocessor** **system**

V. E. Boros, A. D. Rakić, S. Parameswaran

June 2000 **Proceedings of the 37th conference on Design automation DAC '00****Publisher:** ACM PressFull text available:  pdf(135.05 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We describe the first iteration of a comprehensive model with which we can investigate the practical limits on optical bus bandwidth and number of bus processing modules for given signal power. The selection algorithm will ultimately allow programmable evaluation of system parameters bus bandwidth, optical power budget, electrical power budget, number of modules and space consumption for an optimal design that is suited to on-the-fly system reconfiguration.

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41 [Optical realizations of neural network models](#)

Demetri Psaltis

November 1986 **Proceedings of 1986 ACM Fall joint computer conference ACM '86**

Publisher: IEEE Computer Society Press

Full text available: [pdf\(561.37 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)



42 [A volume density optical model](#)

Peter L. Williams, Nelson Max

December 1992 **Proceedings of the 1992 workshop on Volume visualization VVS '92**

Publisher: ACM Press

Full text available: [pdf\(807.78 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



43 [Authentication: Pass-thoughts: authenticating with our minds](#)

Julie Thorpe, P. C. van Oorschot, Anil Somayaji

September 2005 **Proceedings of the 2005 workshop on New security paradigms NSPW '05**

Publisher: ACM Press

Full text available: [pdf\(3.94 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)



We present a novel idea for user authentication that we call *pass-thoughts*. Recent advances in Brain-Computer Interface (BCI) technology indicate that there is potential for a new type of human-computer interaction: a user transmitting thoughts directly to a computer. The goal of a pass-thought system would be to extract as much entropy as possible from a user's brain signals upon "transmitting" a thought. Provided that these brain signals can be recorded and processed in an accurate and ...

Keywords: authentication, passwords

44 [Application of automated design migration to alternating phase shift mask design](#)

Fook-Luen Heng, Lars Liebmann, Jennifer Lund

April 2001 **Proceedings of the 2001 international symposium on Physical design ISPD '01**

Publisher: ACM Press



Full text available: [pdf\(275.11 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The use of phase shifted mask (PSM) has been demonstrated to be a powerful resolution enhancement technique (RET) for the printing of features at dimensions below the exposure wavelength in deep submicron technologies. Its implementation in physical design has introduced non-conventional design ground rules, which impact the traditional layout migration process and designers productivity. In this panel discussion paper, we propose a solution to extend the traditional constraint-based layout ...

Keywords: design migration, phase-shifting mask, resolution enhancement technique

45 Scientific visualization and data modeling of scattered sediment contaminant data in New York/New Jersey estuaries 

Hong Ma, Keith W. Jones, Eric A. Stern

October 1998 **Proceedings of the conference on Visualization '98 VIS '98**

Publisher: IEEE Computer Society Press

Full text available: [pdf\(769.11 KB\)](#)

 [Publisher Site](#)

Additional Information: [full citation](#), [references](#), [index terms](#)

Keywords: scattered data modeling, spectral domain decompositon method

46 Computation hierarchy for in-network processing 

Vlasios Tsiatsis, Ram Kumar, Mani B. Srivastava

August 2005 **Mobile Networks and Applications**, Volume 10 Issue 4

Publisher: Kluwer Academic Publishers

Full text available: [pdf\(1.07 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper we explore the network level architecture of distributed sensor systems that perform in-network processing. We propose a system with heterogeneous nodes that organizes into a hierarchical structure dictated by the computational capabilities. The presence of high-performance nodes amongst a sea of resource-constrained nodes exposes new tradeoffs for the efficient implementation of network-wide applications. Our experiments show that even for a low relative density of resource-constr ...

Keywords: energy-latency-accuracy tradeoffs, heterogeneity, hierarchy, in-network processing, system-level task mapping

47 Queries and aggregation: Computation hierarchy for in-network processing 

 Ram Kumar, Vlasios Tsiatsis, Mani B. Srivastava

September 2003 **Proceedings of the 2nd ACM international conference on Wireless sensor networks and applications WSNA '03**

Publisher: ACM Press

Full text available: [pdf\(346.51 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper, we explore the network level architecture of distributed sensor systems that perform in-network processing. We propose a system with heterogeneous nodes that organizes into a hierachal structure dictated by the computational capabilities. The presence of high-performance nodes amongst a sea of resource constrained nodes exposes new tradeoffs in the efficient implementation of network-wide applications. The introduction of hierarchy enables partitioning of the application into sub ...

Keywords: computation offloading, hierarchical architecture, in-network processing

48 From Electron Mobility to Logical Structure: A View of Integrated Circuits

 Wesley A. Clark

September 1980 **ACM Computing Surveys (CSUR)**, Volume 12 Issue 3

Publisher: ACM Press

Full text available:  pdf(3.29 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



49 Session 12: Special Session: reliability challenges for 65NM and beyond: Reliability

 challenges for 45nm and beyond

J. W. McPherson

July 2006 **Proceedings of the 43rd annual conference on Design automation DAC '06**

Publisher: ACM Press

Full text available:  pdf(2.21 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Scaling, for enhanced performance and cost reduction, has pushed existing CMOS materials much closer to their intrinsic reliability limits. This will require that designers will have to be very careful with: high current densities, voltage overshoots, localized hot spots on the chip, high duty-cycle applications, and high thermal-resistance packaging. In addition to the reliability issues, interconnect RC time-delay will worsen with scaling because Cu resistivity is expected to increase due to surf ...

Keywords: CMOS, design, materials, reliability, scaling



50 New Perspectives and Opportunities From the Wild West of Microelectronic Biochips

Nicolo Manaresi, Gianni Medoro, Melanie Abonnenc, Vincent Auger, Paul Vulto, Aldo Romani, Luigi Altomare, Marco Tartagni, Roberto Guerrieri

March 2005 **Proceedings of the conference on Design, Automation and Test in Europe - Volume 2 DATE '05**

Publisher: IEEE Computer Society

Full text available:  pdf(156.99 KB) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Application of Microelectronic to bioanalysis is an emerging field which holds great promise. From the standpoint of electronic and system design, biochips imply a radical change of perspective, since new, completely different constraints emerge while other usual constraints can be relaxed. While electronic parts of the system can rely on the usual established design-flow, fluidic and packaging design, calls for a new approach which relies significantly on experiments. We hereby make some genera ...



51 Mathematical model of the probe volume in an optical particle sizing device

 Shadrok Samavi, James D. Gassaway

September 1992 **ACM SIGSIM Simulation Digest**, Volume 22 Issue 2

Publisher: ACM Press

Full text available:  pdf(279.73 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)



This paper presents a new approach in numerical simulation and mathematical modeling of the sample volume in an optical particle-sizing instrument (MSU-PSI) [1]. This is done for when the device is operating in Small Angle Near Forward Scattering (SANFS) mode. The instrument is designed to perform on-line measurement of the particle-size distributions by means of non-intrusive methods. This is achieved by measuring the size of individual particles in a sample volume. The sample volume in the SAN ...

52 Design and Behavioral Modeling Tools for Optical Network-on-Chip

M. Brière, L. Carrel, T. Michalke, F. Mieyeville, I. O'Connor, F. Gaffiot

February 2004 **Proceedings of the conference on Design, automation and test in Europe - Volume 1 DATE '04****Publisher:** IEEE Computer SocietyFull text available:  pdf(81.88 KB) Additional Information: [full citation](#), [abstract](#), [index terms](#)

In this paper, we present a tool to analyse photonic devices that can be used to realize basic building blocks of an optical network-on-chip (ONoC). Co-design between electrical tools and optical tools is possible. The VHDL-AMS language has been used to implement behavioral models of photonic devices. For low-level simulation, a gateway between an optical simulator, based on the finite elements method, and a typical EDA layout editor has been realized.

53 Motion capture, editing & planning: Mapping optical motion capture data to skeletal motion using a physical model

Victor Brian Zordan, Nicholas C. Van Der Horst

July 2003 **Proceedings of the 2003 ACM SIGGRAPH/Eurographics symposium on Computer animation SCA '03****Publisher:** Eurographics AssociationFull text available:  pdf(5.39 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Motion capture has become a premiere technique for animation of humanlike characters. To facilitate its use, researchers have focused on the manipulation of data for retargeting, editing, combining, and reusing motion capture libraries. In many of these efforts joint angle plus root trajectories are used as input, although this format requires an inherent mapping from the raw data recorded by many popular motion capture set-ups. In this paper, we propose a novel solution to this mapping problem ...

54 New graph bipartizations for double-exposure, bright field alternating phase-shift mask layout

Andrew B. Kahng, Shailesh Vaya, Alexander Zelikovsky

January 2001 **Proceedings of the 2001 conference on Asia South Pacific design automation ASP-DAC '01****Publisher:** ACM PressFull text available:  pdf(137.08 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We describe new graph bipartition algorithms for lay-out modification and phase assignment of bright-field alternating phase-shifting masks (AltPSM) [25]. The problem of layout modification for phase-assignability reduces to the problem of making a certain layout-derived graph bipartite (i.e., 2-colorable). Previous work [3] solves bipartition optimally for the dark field alternating PSM regime. Only one degree of freedom is allowed (and relevant) for such a bipartition: edge deletion, ...

55 General storage protection techniques: Ensuring data integrity in storage: techniques and applications

Gopalan Sivathanu, Charles P. Wright, Erez Zadok

November 2005 **Proceedings of the 2005 ACM workshop on Storage security and survivability StorageSS '05****Publisher:** ACM PressFull text available:  pdf(217.83 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Data integrity is a fundamental aspect of storage security and reliability. With the advent of network storage and new technology trends that result in new failure modes for

storage, interesting challenges arise in ensuring data integrity. In this paper, we discuss the causes of integrity violations in storage and present a survey of integrity assurance techniques that exist today. We describe several interesting applications of storage integrity checking, apart from security, and discuss the im ...

Keywords: file systems, intrusion detection, storage integrity

56 Applied optical illusions: a simulation model of eye response helps improve visual scene simulation □

 W. Marvin Bunker
January 1978 **ACM SIGSIM Simulation Digest**, Volume 9 Issue 2-4

Publisher: ACM Press

Full text available:  [pdf\(1.71 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Modifications made to improve results in computer generated images (CGI) for visual scene simulation provided results better than anticipated. Understanding is essential to effective use of any technique. In this investigation, the response characteristics of the eye were simulated with a computer model. The tonal patterns resulting from CGI processing were applied as the stimulus, and the subjective eye response was obtained. This explained the experimental results and provided guidance for app ...

57 A photon accurate model of the human eye □

 Michael F. Deering
July 2005 **ACM Transactions on Graphics (TOG) , ACM SIGGRAPH 2005 Papers SIGGRAPH '05**, Volume 24 Issue 3

Publisher: ACM Press

Full text available:   [pdf\(1.09 MB\)](#) [mov\(27:4 MIN\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

A photon accurate model of individual cones in the human eye perceiving images on digital display devices is presented. Playback of streams of pixel video data is modeled as individual photon emission events from within the physical substructure of each display pixel. The thus generated electromagnetic wavefronts are refracted through a four surface model of the human cornea and lens, and diffracted at the pupil. The position, size, shape, and orientation of each of the five million photorecepto ...

Keywords: display devices, eye models, human eye cone models, schematic eyes, synthesized retina

58 The computation of optical flow □

 S. S. Beauchemin, J. L. Barron
September 1995 **ACM Computing Surveys (CSUR)**, Volume 27 Issue 3

Publisher: ACM Press

Full text available:  [pdf\(3.06 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Two-dimensional image motion is the projection of the three-dimensional motion of objects, relative to a visual sensor, onto its image plane. Sequences of time-ordered images allow the estimation of projected two-dimensional image motion as either instantaneous image velocities or discrete image displacements. These are usually called the optical flow field or the image velocity field. Provided that optical flow is a reliable approximation to two-dimensional ...

59

Optimal placement of high-probability randomly retrieved blocks on CLV optical discs □



Daniel Alexander Ford, Stavros Christodoulakis

January 1991 **ACM Transactions on Information Systems (TOIS)**, Volume 9 Issue 1**Publisher:** ACM PressFull text available: [pdf\(1.64 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Optimal data placement on a CLV (Constant Linear Velocity) format optical discs has an objective the minimization of the expected access cost of data retrievals from the disc when the probabilities of access of data items may be different. The problem of optimal data placement for optical discs is both important and more difficult than the corresponding problem on magnetic discs. A good data placement on optical discs is more important because data sets on optical discs such as WORM and CD ...

Keywords: management, performance**60** A general approach for all-to-all routing in multihop WDM optical networks

Weifa Liang, Xiaojun Shen

August 2006 **IEEE/ACM Transactions on Networking (TON)**, Volume 14 Issue 4**Publisher:** IEEE PressFull text available: [pdf\(422.05 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

WDM optical networks provide unprecedented high speed and reliability for message transfer among the nodes. All-to-all routing is a fundamental routing problem in such networks and has been well studied on single hop WDM networks. However, the number of wavelengths to realize all-to-all routing on the single hop model typically is very large. One way to reduce the number of wavelengths is to use k -hop routing, in which each routing path consists of k segments and each segment is as ...

Keywords: WDM routing, all-to-all routing, gossiping, multihop routing algorithms, network design, optical networks, robust routing protocol

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1 Dynamic data driven application simulation: sensor/simulation fusion: DDDAS approaches to wildland fire modeling and contaminant tracking

Craig C. Douglas, Robert A. Lodder, Richard E. Ewing, Yalchin Efendiev, Guan Qin, Janice Coen, Mauricio Kritz, Jonathan D. Beezley, Jan Mandel, Mohamed Iskandarani, Anthony Vodacek, Gundolf Haase

December 2006 **Proceedings of the 37th conference on Winter simulation WSC '06**

Publisher: Winter Simulation Conference

Full text available: [pdf\(203.65 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

We report on two ongoing efforts to build Dynamic Data Driven Application Systems (DDDAS) for (1) short-range forecasting of weather and wildfire behavior from real time weather data, images, and sensor streams, and (2) contaminant identification and tracking in water bodies. Both systems change their forecasts as new data is received. We use one long term running simulation that self corrects using out of order, imperfect sensor data. The DDDAS versions replace codes that were previously run us ...

2 Facial modeling and animation

Jörg Haber, Demetri Terzopoulos

August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**

Publisher: ACM Press

Full text available: [pdf\(18.15 MB\)](#) Additional Information: [full citation](#), [abstract](#)

In this course we present an overview of the concepts and current techniques in facial modeling and animation. We introduce this research area by its history and applications. As a necessary prerequisite for facial modeling, data acquisition is discussed in detail. We describe basic concepts of facial animation and present different approaches including parametric models, performance-, physics-, and learning-based methods. State-of-the-art techniques such as muscle-based facial animation, mass-s ...

3 Reflectance and texture of real-world surfaces

Kristin J. Dana, Bram van Ginneken, Shree K. Nayar, Jan J. Koenderink

January 1999 **ACM Transactions on Graphics (TOG)**, Volume 18 Issue 1

Publisher: ACM Press

Full text available: [pdf\(6.94 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this work, we investigate the visual appearance of real-world surfaces and the dependence of appearance on the geometry of imaging conditions. We discuss a new

texture representation called the BTF (bidirectional texture function) which captures the variation in texture with illumination and viewing direction. We present a BTF database with image textures from over 60 different samples, each observed with over 200 different combinations of viewing and illumination directions. We describe ...

4 BioMEMS: Design tools for BioMEMS

 Tom Korsmeyer, Jun Zeng, Ken Greiner

June 2004 **Proceedings of the 41st annual conference on Design automation DAC '04**

Publisher: ACM Press

Full text available:  [pdf\(852.47 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Microsystems used for chemical analyses and biological assays are termed BioMEMS or labs-on-a-chip. These systems often require some of the traditional electromechanical capabilities of MEMS, and in addition require the manipulation of fluids in either continuous flow or droplet form. The distinction between continuous flow and droplets defines two broad categories of BioMEMS. Different applications call for one or the other of these approaches, but in either case, software for design and simulation c ...

Keywords: BEM, BioMEMS, CAD, FEM, MEMS, PTAS, lab-on-a-chip, system-level modeling

5 GPU Cluster for High Performance Computing

Zhe Fan, Feng Qiu, Arie Kaufman, Suzanne Yoakum-Stover

November 2004 **Proceedings of the 2004 ACM/IEEE conference on Supercomputing SC '04**

Publisher: IEEE Computer Society

Full text available:  [pdf\(793.59 KB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#)

Inspired by the attractive Flops/dollar ratio and the incredible growth in the speed of modern graphics processing units (GPUs), we propose to use a cluster of GPUs for high performance scientific computing. As an example application, we have developed a parallel flow simulation using the lattice Boltzmann model (LBM) on a GPU cluster and have simulated the dispersion of airborne contaminants in the Times Square area of New York City. Using 30 GPU nodes, our simulation can compute a 480x400x80 L ...

Keywords: GPU cluster, data intensive computing, lattice Boltzmann model, urban airborne dispersion, computational fluid dynamics

6 The neXT computer

 T. Dietrich

August 1989 **ACM SIGSMALL/PC Notes**, Volume 15 Issue 3

Publisher: ACM Press

Full text available:  [pdf\(1.04 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

What's NeXT? NeXT is Steve Jobs. In September of 1985 Jobs was stripped of his authority at the very company he and his friend Steve Wozniak had created - Apple Computer, Inc. Apple Computer, one of the most successful computer companies ever, is viewed by many as the company that got the personal computer industry rolling. In fact, Apple's first computer, the Apple 1, was introduced in 1976' - almost six years before IBM introduced its infamous PC.

7

Applications: LaserSPECKs:: laser SPECtroscopic trace-gas sensor networks - sensor integration and applications

- ◆ Stephen So, Farinaz Koushanfar, Anatoliy Kosterev, Frank Tittel
◆ April 2007 **Proceedings of the 6th international conference on Information processing in sensor networks IPSN '07**

Publisher: ACM Press

Full text available: [pdf\(437.15 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We introduce a novel laser spectroscopic trace-gas sensor platform, LaserSPECks that integrates recently developed miniature quartz-enhanced photoacoustic spectroscopy (QE-PAS) gas sensing technology. This universal platform uses infrared laser spectroscopy to detect and quantify numerous gas species at part-per-million to part-per-billion (ppm-ppb) concentrations [2]. Traditional gas sensing devices capable of the same sensitivity and specificity are several orders of magnitude larger in size, ...

Keywords: lasers, sensors, spectroscopy, trace gas sensing

- 8 [Embedded hardware design case studies: Design techniques for sensor appliances: foundations and light compass case study](#)

- ◆ Jennifer L. Wong, Seapahn Megerian, Miodrag Potkonjak
June 2003 **Proceedings of the 40th conference on Design automation DAC '03**

Publisher: ACM Press

Full text available: [pdf\(454.79 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We propose the first systematic, sensor-centric approach for quantitative design of sensor network appliances. We demonstrate its use by designing light appliance devices and the associated middleware. We have developed five models which are required to make this problem tractable and to undertake the challenging task of designing light sensor appliances: (i) physical world, (ii) light sensor, (iii) physical phenomenon, (iv) appliance design, and (v) computational model. With these models in place ...

Keywords: sensor appliances, sensor networks

- 9 [Data collection and evaluation II: Text on tap: the ACL/DCI](#)

Mark Liberman

October 1989 **Proceedings of the workshop on Speech and Natural Language HLT '89**

Publisher: Association for Computational Linguistics

Full text available: [pdf\(994.31 KB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#)

There has been a recent upsurge of interest in computational studies of large bodies of text. The aim of such studies varies widely, from lexicography and studies of language change to automatic indexing methods and statistical models for improving the performance of speech recognition systems and optical character readers. In general, corpus-based studies are critical for the development of adequate models of linguistic structure and for insights into the nature of language use. However, research ...

- 10 [Surface modification tools in a virtual environment interface to a scanning probe microscope](#)

- ◆ Mark Finch, Vernon L. Chi, Russell M. Taylor, Mike Falvo, Sean Washburn, Richard Superfine
April 1995 **Proceedings of the 1995 symposium on Interactive 3D graphics SI3D '95**

Publisher: ACM Press

Full text available: [pdf\(3.87 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The NanoManipulator system has been expanded from a virtual-reality interface for a specific scanning tunneling microscope to include control of atomic force microscopes. The current state of the system is reviewed, and new tools extending the user's feel and

control in manipulation and fabrication in the mesoscopic regime are detailed. Manipulations that could not be performed using the techniques available from commercial SPM systems are demonstrated, and the direction of ongoing research ...

Keywords: atomic force microscopy, force, haptic, interactive graphics, scanning tunneling microscopy, scientific visualization, teleoperation, telepresence, virtual worlds

11 Focusing on user-to-product relationships: GMS: preserving multiple expert voices in 

 Scientific knowledge management

Adria H. Liszka, William A. Stubblefield, Stephen D. Kleban

June 2003 **Proceedings of the 2003 conference on Designing for user experiences DUX '03**

Publisher: ACM Press

Full text available:  pdf(401.55 KB) Additional Information: [full citation](#), [abstract](#), [references](#)

Computer archives of scientific and engineering knowledge must insure the accuracy, completeness, and validity of their contents. Unfortunately, designers of these sites often overlook the social and cognitive context of scientific activity in favor of highly distilled collections of theoretical findings and technical data, divorcing scientific information from its human origins. Contextual aspects of knowledge seldom find their way into journals and other scientific forums, yet they often reveal ...

Keywords: cognitive psychology, ethnography, expert communities, information architecture, interaction design, knowledge design, scientific knowledge management, user interface design

12 Optics: lighting the way to EDA riches?: A fast optical propagation technique for 

 modeling micro-optical systems

Kurzweg P. Kurzweg, Steven P. Levitan, Jose A. Martinez, Kahrs Kahrs, Donald M. Chiarulli
June 2002 **Proceedings of the 39th conference on Design automation DAC '02**

Publisher: ACM Press

Full text available:  pdf(245.71 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

As designers become more aggressive in introducing optical components to micro-systems, rigorous optical models are required for system-level simulation tools. Common optical modeling techniques and approximations are not valid for most optical micro-systems, and those techniques that provide accurate simulation are computationally slow. In this paper, we introduce an angular frequency optical propagation technique that greatly reduces computation time while achieving the accuracy of a full scal ...

Keywords: CAD, angular spectrum, optical MEMS, optical micro-systems, optical propagation

13 Interconnect technology evaluation: Modeling of the performance of carbon nanotube 

 bundle, cu/low-k and optical on-chip global interconnects

Hoyeol Cho, Kyung-Hoae Koo, Pawan Kapur, Krishna C. Saraswat

March 2007 **Proceedings of the 2007 international workshop on System level interconnect prediction SLIP '07**

Publisher: ACM Press

Full text available:  pdf(468.31 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this work, we have quantified and compared the performance of carbon nanotube (CNT) and optical interconnects with the existing technology of Cu/low-K interconnects for future high-performance ICs. We present these comparisons not only in terms of

commonly used metrics such as latency and power dissipation, but also compare them using important compound performance metrics, such as, bandwidth density per latency per power. We find that the optical interconnect has the lowest latency for gl ...

Keywords: Cu, Global interconnects, bandwidth density, carbon nanotube, latency, optics, power

14 Dimensioning optical networks under traffic growth models 

Tapan Kumar Nayak, Kumar N. Sivarajan

December 2003 **IEEE/ACM Transactions on Networking (TON)**, Volume 11 Issue 6

Publisher: IEEE Press

Full text available:  pdf(899.24 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we consider the problem of dimensioning a large optical wavelength-division multiplexing (WDM) network assuming the traffic is growing over time. Traffic between pairs of nodes is carried through lightpaths which are high-bandwidth end-to-end circuits, occupying a wavelength on each link of the path between two nodes. We are interested in dimensioning the WDM links so that the first lightpath request rejection will occur, with high probability, after a specified period of time ...

Keywords: capacity allocation, capacity exhaustion probability, stochastic modeling, traffic growth model

15 Concepts of computer-based modeling for consultation in optics and refraction 

 C. A. Kulikowski, A. Safir

October 1976 **Proceedings of the annual conference ACM 76**

Publisher: ACM Press

Full text available:  pdf(551.43 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper we discuss general principles of computer science applied to problems of medical consultation. We describe some of the design considerations for a computer-based consultation program in optics and refraction. Since the visual system is the input pathway for most of the data entering the central nervous system, the process of refraction serves important purposes beyond the generation of a prescription for a pair of eyeglasses. Refraction, the measurement and correction of optic ...

16 High-level model of a WDMA passive optical bus for a reconfigurable multiprocessor system 

 V. E. Boros, A. D. Rakić, S. Parameswaran

June 2000 **Proceedings of the 37th conference on Design automation DAC '00**

Publisher: ACM Press

Full text available:  pdf(135.05 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We describe the first iteration of a comprehensive model with which we can investigate the practical limits on optical bus bandwidth and number of bus processing modules for given signal power. The selection algorithm will ultimately allow programmable evaluation of system parameters bus bandwidth, optical power budget, electrical power budget, number of modules and space consumption for an optimal design that is suited to on-the-fly system reconfiguration.

17 Optical realizations of neural network models 

Demetri Psaltis

November 1986 **Proceedings of 1986 ACM Fall joint computer conference ACM '86**

Publisher: IEEE Computer Society Press

Full text available:  pdf(561.37 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

18 A volume density optical model 

 Peter L. Williams, Nelson Max

December 1992 **Proceedings of the 1992 workshop on Volume visualization VVS '92**

Publisher: ACM Press

Full text available:  pdf(807.78 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

19 Authentication: Pass-thoughts: authenticating with our minds 

 Julie Thorpe, P. C. van Oorschot, Anil Somayaji

September 2005 **Proceedings of the 2005 workshop on New security paradigms NSPW '05**

Publisher: ACM Press

Full text available:  pdf(3.94 MB) Additional Information: [full citation](#), [abstract](#), [references](#)

We present a novel idea for user authentication that we call *pass-thoughts*. Recent advances in Brain-Computer Interface (BCI) technology indicate that there is potential for a new type of human-computer interaction: a user transmitting thoughts directly to a computer. The goal of a pass-thought system would be to extract as much entropy as possible from a user's brain signals upon "transmitting" a thought. Provided that these brain signals can be recorded and processed in an accurate and ...

Keywords: authentication, passwords

20 Scientific visualization and data modeling of scattered sediment contaminant data in New York/New Jersey estuaries 

Hong Ma, Keith W. Jones, Eric A. Stern

October 1998 **Proceedings of the conference on Visualization '98 VIS '98**

Publisher: IEEE Computer Society Press

Full text available:  pdf(769.11 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

 Publisher Site

Keywords: scattered data modeling, spectral domain decompositon method

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